UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2008*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,7-17,20-28,31-34 and 37-60* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 7-17, 20-28, 31-34, and 37-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some *   c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the RCE filed on 12/3/2008.

2.   **Claims 1-4, 7-17, 20-28, 31-34, and 37-60** are pending (claims 5-6, 18-19, 29-30, and

35-36 were cancelled).

Specification

3.   The amendment filed on 12/3/2008 is objected to under 35 U.S.C. 132(a) because it

introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall

introduce new matter into the disclosure of the invention. The added material which is not

supported by the original disclosure is as follows: *an ingress module that receives the pause*

frame generated from the egress module of the same network switching device and requests the

source channel to pause sending the frame in response to a receipt of the pause frame as recited

in the amended independent **claims 37, 44, 49, and 51**, and *the ingress module that receives the*

pause release frame from the egress module of the same network switching device and requests

the source channel to resume sending the frames of data in response to a receipt of the pause

release frame as recited in the amended dependent **claims 38, 45, 50, and 52**. In other words,

nowhere in the specification discloses transmission of a pause frame and a pause release frame

within the same network switching device, i.e., from the egress module to the ingress module, as

currently amended in claims 37-38, 44-45, and 49-52 (note that paragraphs 0011-0012 disclose

an ingress module receiving a pause frame and a pause release frame which are actually

transmitted from another network device (see how the egress module responds to the respective

pause frame and pause release frame)).

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making
> and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it
> pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode
> contemplated by the inventor of carrying out his invention.

Claims 37-52 and 57-60 are rejected under 35 U.S.C. 112, first paragraph, as failing to

comply with the written description requirement. The claim(s) contains the following subject

matter which was not described in the specification in such a way as to reasonably convey to one

skilled in the relevant art that the inventor(s), at the time the application was filed, had

possession of the claimed invention: *an ingress module that receives the pause frame generated*

from the egress module of the same network switching device and requests the source channel to

pause sending the frame in response to a receipt of the pause frame as recited in the amended

independent **claims 37, 44, 49, and 51**, and *the ingress module that receives the pause release*

frame from the egress module of the same network switching device and requests the source

channel to resume sending the frames of data in response to a receipt of the pause release frame

as recited in the amended dependent **claims 38, 45, 50, and 52**. In other words, nowhere in the

specification discloses transmission of a pause frame and a pause release frame within the same

network switching device, i.e., from the egress module to the ingress module, as currently

amended in claims 37-38, 44-45, 49-52 (note that paragraphs 0011-0012 disclose an ingress

module receiving a pause frame and a pause release frame which are actually transmitted from

another network device (see how the egress module responds to the respective pause frame and

pause release frame)).

Please note that should the new matter be removed, the previous rejection still applies.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

6.   **Claims 1-2, 7-11, 14-15, 20-22, 25-26, 31-32, and 53-56** are rejected under 35 U.S.C.

103(a) as being unpatentable over an art of record, Erimli (US 6,405,258 B1) in view of Chiussi

(US 7,027,457 B1).

Regarding **claim 1**, Erimli teaches a network switching device (multiport switch 12, Fig.

1) comprising:

An ingress module (receiving means of the MAC unit 20, Fig. 2 that receives data from

other device into the multiport switch 12) configured to receive frames of data from a first

channel (RMII 18, Fig. 1 connecting first network station 14a) and store the frames of data in

one or more buffers (buffers located in the external memory 36, Fig. 1). See col. 5, lines 14-27,

col. 6, lines 11-13, 17-28, and col. 7, lines 32-41, 54-57. Wherein each frame of data has one or

more plurality of classes of service (high priority frames and low priority frames (col. 6, lines 54-62).

One or more queues (output queues 58, Fig. 2, col. 8, lines 43-50).

A forwarding module (the port vector FIFO 56, Fig. 2) configured to enqueue each of the buffers by sending a pointer (the frame pointer) for each of the buffers to the one or more queues (output queues 58, Fig. 2) after the ingress module stores the frames of data in one or more of the one or more buffers (buffers located in the external memory 36, Fig. 1). See col. 15, lines 6-10.

An egress module (transmitting means of the MAC unit 20, Fig. 2 that transmits data from the multiport switch 12 to other device(s)) configured to retrieve the frames of data from the one or more buffers and transmit the retrieved frames of data to a second channel (a corresponding RMI 18 connecting second network station 14b). See col. 5, lines 14-22, col. 6, lines 11-13, and col. 7, lines 32-41, 57-62.

Wherein the egress module (transmitting means of the MAC unit 20, Fig. 2 that transmits data from the multiport switch 12) exercises a flow control (generating and transmitting a PAUSE frame) on the channel for each of the classes of service when the number of queue entries for the class of service exceeds a predetermined threshold for the class of service (output port 90a in Fig. 6 generates a PAUSE frame, col. 15, lines 11-46; see also col. 5, lines 14-22 and col. 7, lines 32-41, 57-62, col. 12, lines 57-61).

Although Erimli teaches (i) keeping track of the number of entries/frame pointers currently stored in the output queues 58, Fig. 2 for the respective queue priority, (ii) comparing the number the respective queue entries to the corresponding threshold value in order to

determine whether to implement flow control (col. 11, lines 65-col. 12, lines 37, 57-61, col. 15, lines 11-42), and (iii) returning the frame pointer after transmitting the data stored in a buffer for a frame received from the channel and having the respective class of service from the network switching device (fetching the frame data from the location in external memory 36 and storing the frame data into the transmit FIFO, then returning the frame pointer to the free buffer queue 64, col. 9, lines 4-23), Erimli does not explicitly teach that the tracking number of queue entries is done by using a plurality of counters, storing a corresponding count, incrementing the count when the forwarding module enqueues one of the buffers, and decrementing the count after the stored data is transmitted, and exercising flow control when the count for the class of service exceeds the threshold as recited in the claim.

However, in an analogous art of packet transmission with flow control (col. 14, lines 30-56), Chiussi teaches using a plurality of counter 330 in Fig. 3 corresponding to different QoS levels to quantitatively keep track of the number of corresponding QoS queues (col. 6, lines 30-33; equivalent to tracking number of queue entries/frame pointers by a plurality of counters and storing a corresponding count) by incrementing a counter when data with an associated QoS is stored into one of the corresponding queues (step 720 in Fig. 7A and col. 12, lines 64-67; equivalent to incrementing count for a class of service) and decrementing the counter when data is removed from the queue (step 730 in Fig. 7B and col. 13, lines 48-52; equivalent to decrementing count for a class of service).

Given the teaching of Chiussi, it would have been obvious to one skilled in the art at the time the invention was made to modify the teaching of Erimli to apply Chiussi's concept of tracking the number of buffers for each class of service using a counter such that the tracking number of queue entries, including incrementing and decrementing counter value, would be done by using a plurality of counter values such that a plurality of counters comprising one counter for each of the classes of service wherein each of the counters is configured to store a count for the channel for a respective one of the classes of service, the step of incrementing the count when the forwarding module enqueues one of the buffers storing the data of one of the frames having the respective class of service, and the step of decrementing the count after the data stored in a buffer for a frame received from the channel and having the respective class of service is transmitted from the network switching device, and the step of exercising flow control when the count for the class of service exceeds the threshold by the egress module would be included as claimed. The suggestion/motivation to do so would have been to track and monitor the number of packets in each QoS queue (equivalent to number of entries/frame pointers) for each class of service using a counter as taught by Chiussi (col. 12, lines 65-67 and col. 13, lines 48-51).

Regarding **claim 2**, Erimli also teaches that, wherein, to exercise flow control for one of the classes of service, the egress module (output port 90a, Fig. 6) is further configured to send a pause frame (PAUSE frame) to the first channel (RMII 18, Fig. 1 connecting first network station 14a), and wherein the pause frame indicates the one of the classes of service to be paused (the PAUSE frame includes Opcode field indicating whether the PAUSE frame corresponds to

the high or low priority threshold value). See col. 15, lines 37-46; see also col. 12, lines 57-61

and col. 13, lines 36-40.

Regarding **claim 10**, Erimli also teaches a memory (external memory 36, Fig. 1)

comprising the buffers (col. 6, lines 17-28).

Claims 8, 14, and 15 are network switching device claims containing similar limitation

as recited in device claims 1, 1, 2, respectively, and are therefore rejected under the same reason

set forth in the rejection of claims 1, 1, 2, respectively.

Claims 7, 11, and 20 are integrated circuit (CPU 32, SSRAM 36, and multiport switch

12 in Fig. 1 constitute an integrated circuit) claims comprising the network switching device of

claims 1, 10, and 14, respectively, and are therefore rejected under the same reason set forth in

the rejection of claims 1, 10, and 14, respectively.

Claim 21 is a network switch (CPU 32, SSRAM 36, and multiport switch 12 in Fig. 1

constitute a network switch) comprising the network switching device of claim 14 and is

therefore rejected under the same reason set forth in the rejection of claim 14.

Claims 9 and 22 are output-queued network switch (CPU 32, SSRAM 36, and multiport

switch 12 in Fig. 1 constitute an output-queued network switch) claims comprising the network

switching device of claims 1 and 14, respectively, and are therefore rejected under the same

reason set forth in the rejection of claims 1 and 14, respectively.

Claims 25-26 are method claims corresponding to device claims 1-2, respectively, and

are therefore rejected under the same reason set forth in the rejection of claims 1-2, respectively.

Claims 31 and 32 are computer readable medium claims containing instructions for

controlling an apparatus similar to device in claims 1 and 2, respectively and are therefore

rejected under the same reason set forth in the rejection of claims 1 and 2, respectively with an

exception that Erimli does not teach that the instructions are executable by a computer and

embodied in a computer program stored on a computer readable medium. However, an Official

notice is taken that it is well known in the art to implement the instructions as a computer

program to be executable by a computer and store on a computer readable medium for easy

installation and portability purposes. Therefore, it would have been obvious to one skilled in the

art at the time the invention was made to modify the teaching of Erimli such that the instructions

would be executable by a computer and embodied in a computer program stored on a computer

readable medium as claimed for easy installation and portability purposes.

Regarding **claims 53, 54, 55, and 56**, Erimli further teaches that the predetermined

threshold is a dynamic pause threshold (col. 12, lines 17-22).

7.   **Claims 3-4, 12-13, 16-17, 23-24, 27-28, and 33-34** are rejected under 35 U.S.C. 103(a)

as being unpatentable over an art of record, Erimli (US 6,405,258 B1) in view of Chiussi (US

7,027,457 B1), and further in view of Feuerstraeter (hereinafter "Feuer") (US 2003/0123393

A1).

Regarding **claims 3 and 4**, Erimli does not teach that the egress module is further

configured to terminate flow control on the channel for each of the classes of service by sending

a pause release frame indicating the one of the classes of service when the count for the class of

service but not yet transmitted from the network switching device falls below a further

predetermined threshold.

However, in an analogous art of flow control, Feuer teaches that a flow control agent 214

in Fig. 2 (equivalent to the egress module) performs a flow control by generating a control

message in order to suspend transmission of content having a priority level associated with

buffer queue 302, 304, or 306 in Fig. 3 (equivalent to the buffers storing frames of data having

the class of service) whose number of occupied memory locations has reached a threshold 308

(paragraphs 32-33) and issuing a revised control command (equivalent to a pause release frame)

denoting the priority level associated with the buffer queue that becomes available/falls below

threshold 308and transmitting it via channel 106 in Fig. 1 (paragraph 21) to an upstream device

when the buffer queue associated with the priority level becomes available/falls below threshold

308,Fig. 3 in order to refresh a disable of communicate (paragraph 44, see also paragraphs 33

and 39, lines 15-22) (equivalent to terminating flow control on the channel for each of the classes

of service by sending a pause release frame indicating the one of the classes of service when the

count for the class of service falls below a further predetermined threshold for the class of

service.

Given the teaching of Feuer, it would have been obvious to one skilled in the art at the

time of the invention to further modify the combined teaching of Erimli and Chiussi to apply the

concept of issuing a revised control command such that the egress module would be further

configured to terminate flow control on the channel for each of the classes of service by sending

a pause release frame indicating the one of the classes of service when the count for the class of

service but not yet transmitted from the network switching device falls below a further

predetermined threshold as claimed. The suggestion/motivation to do so would have been to

enable the transmission when the buffer (e.g., queue) associated with the priority level becomes

available/falls below the threshold as taught be Feuer (paragraph 44).

Regarding **claims 12 and 13**, Erimli teaches a reserve module (output queue 58 in Fig.

2/400, Fig. 5A) configured to reserve one or more buffers (one or more buffers reads on a

maximum number of memory location(s) in output queue 58/400, Fig. 5A that are allocated for

storing frame pointers, col. 15, lines 6-43; see also col. 12, lines 15-22) to the channel (RMII 18,

Fig. 1), wherein a pause threshold/a pause release threshold (both are not further defined, read on

a value of the low priority watermark threshold for triggering the transmission of a PAUSE

frame) for the channel is a function of the number of the buffers reserved to the channel (a value

of the low priority watermark threshold is a maximum number of entries that are allowed in the

output queue; col. 12, lines 15-22 and col. 15, lines 22-43).

Claims 16, 17, and 23/24 are network switching claims containing similar limitation as

recited in device claims 3, 4, and 13, respectively, and are therefore rejected under the same

reason set forth in the rejection of claims 3, 4, and 13, respectively.

Claims 27 and 28 are method claims corresponding to device claims 3 and 4,

respectively, and are therefore rejected under the same reason set forth in the rejection of claims

3 and 4, respectively.

Claims 33 and 34 are computer readable medium claims containing instructions for

controlling an apparatus similar to device in claims 3 and 4, respectively and are therefore

rejected under the same reason set forth in the rejection of claims 3 and 4, respectively.

Response to Arguments

8.   Applicant's arguments filed on 12/3/2008 have been fully considered but they are not

persuasive.

A.   In the Remarks on pages 22-23 regarding claim 1, the applicant argues that the output

port 90a in Fig. 6 of Erimli, which corresponds to the claimed ingress module, exercises the flow

control, and therefore, Erimli fails to disclose "an egress module exercises flow control on the

first channel" as recited in the amended claim 1.

         In response, the Examiner respectfully disagrees. It is submitted that Erimli teaches an

egress module exercises flow control on the first channel as claimed. Erimli clearly teaches **an**

ingress module (receiving means of the MAC unit 20, Fig. 2 that receives data into the multiport switch 12) **configured to receive frames of data from a first channel** (RMII 18, Fig. 1 connecting first network station 14a) **and store the frames of data in one or more buffers** (buffers located in the external memory 36, Fig. 1). See col. 5, lines 14-27, col. 6, lines 11-13, 17-28, and col. 7, lines 32-41, 54-57. Erimli also teaches **an egress module** (transmitting means of the MAC unit 20, Fig. 2 that transmits data from the multiport switch 12) **configured to retrieve the frames of data from the one or more buffers and transmit the retrieved frames of data to a second channel** (a corresponding RMI 18 connecting second network station 14b) (col. 5, lines 14-22, col. 6, lines 11-13, and col. 7, lines 32-41, 57-62) **and exercise a flow control** (generating and transmitting a PAUSE frame) **on the channel for each of the classes of service when the number of queue entries for the class of service exceeds a predetermined threshold for the class of service** (output port 90a in Fig. 6 generates a PAUSE frame, col. 15, lines 11-46; see also col. 5, lines 14-22 and col. 7, lines 32-41, 57-62, col. 12, lines 57-61). Note that the interpretation of receiving means and transmitting means of the MAC unit 20 in Figs. 1 and 3A of Erimli is consistent with an ingress module and an egress module shown in Figs. 2 and 4 of the application as both an ingress module and receiving means perform receiving function, while both an egress module and transmitting means perform transmitting function.

Therefore, it is respectfully submitted that the claimed limitation of an egress module exercises flow control on the first channel as recited in the amended claim 1 is clearly met by Erimli, and the rejection is maintained.

Conclusion

9.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to NITTAYA JUNTIMA whose telephone number is (571)272-3120. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571.272.3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nittaya Juntima/
Examiner, Art Unit 2416
1/28/2009